



Soil/Rock Analyzer

For several years beginning in 1975, NASA operated two Viking Lander spacecraft on the surface of Mars. Built by Martin Marietta Denver Aerospace, each of the Landers carried more than a dozen instruments for photographing and investigating the Martian surface. One, developed by Martin Marietta under contract to Langley Research Center, was an x-ray fluorescence spectrometer that automatically analyzed the planet's soil and rocks. A redesigned version of that system is now being marketed commercially for use in detecting and analyzing metal and mineral elements. Known as the Aurora ATX-100, it is being manufactured by Aurora Tech Incorporated, North Salt Lake, Utah, under a licensing agreement with Martin Marietta.

The system operates on the principle that different elements emit different x-ray energies. Irradiation by radioisotopes causes a sample to emit x-rays at various energies characteristic of the elements in the sample. The spectrometer then measures the energy emissions as a means of determining what elements and in what percentages the sample contains. The

Aurora ATX-100 (top photo) offers self-contained power, an oscilloscope, a liquid crystal readout and a multichannel spectrum analyzer; it can complete an analysis in about 30 seconds. With its batteries, it weighs only 17 pounds, permitting field geologists to make on-the-spot determinations of rock and soil compositions (below) without having to haul loads of samples back to a laboratory.

Other applications include surface and subsurface mineral exploration, pollution monitoring, chemical and mineral industrial process control, analysis of concrete structures and educational demonstrations of x-ray techniques. Last year, Aurora Tech received approval from the State of Utah and the Nuclear Regulatory Commission to sell the radioisotopic unit and made the first deliveries of the system. With a solid backlog of orders and a capability for producing 500 units a month, Aurora Tech is now setting up distributorships abroad. The company is also conducting research and development toward additional applications.

